

Renovating Buildings with PVC alternatives

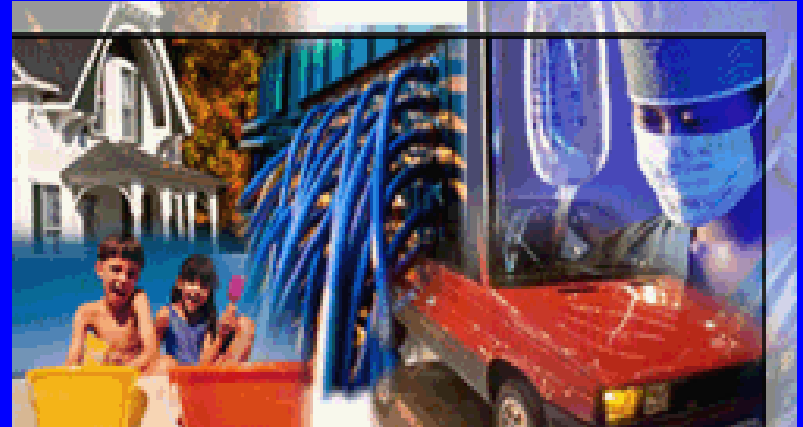
ABAG Dioxin Conference
Oakland City Hall
Oakland, CA
9/18/2002

Tom Lent



PVC: Miracle Plastic

- Strong & durable
- Rigid or flexible
- Opaque or clear.
- Abrasion & moisture resistant
- Rust and corrosion resistant
- Electrically non-conductive
 - > Life saving medical products
 - > Water supplies to Third World



PVC – Toxic Manufacturing

- Ethylene-dichloride
- Vinyl chloride
- Dioxin

Cancer

Immune suppression

Liver damage

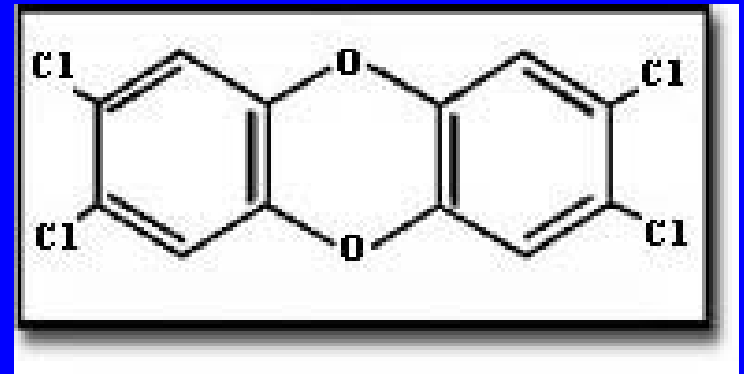
Neurological toxicity

Testicular damage

Greenpeace Photo



Dioxin



- Cancer
 - Endocrine disruption
 - Compromised immune system
 - Learning disabilities
 - Reduced sperm counts
- & other reproductive problems

Everyone is exposed

- Persistent
- Bioaccumulative
- Toxin

Everyone is exposed to the dioxin from your floor



EPA limit = 1pg/kg/day

Average N.A. adult = 2 pg

Cancer risk = 1 in 100 to 1 in 1000

Breast fed infant = 34-53 pg

PVC – Toxic in Use

Plasticizers:

- **Phthalates (DEHP)**
 - Up to 60% by weight
 - Doesn't bind
 - Asthma (vinyl flooring dust)
 - Reproductive/developmental problems
(medical products leachate)
 - 5 million tons of DEHP used annually worldwide
 - *New research – Phthalates evade IAQ tests*



PVC – Toxic in Use

Stabilizers:

- **Lead:**
 - damages brain development
- **Cadmium:**
 - neurological damage
 - cancer
- **Organotins:**
 - Suppress immunity
 - disrupt endocrine system

damage reproductive development



PVC and Fire

**Beverly Hills Supper Club Fire
Southgate, Kentucky
165 died, 116 injured**



Hydrogen Chloride

Fire – the aftermath

Dioxin legacy



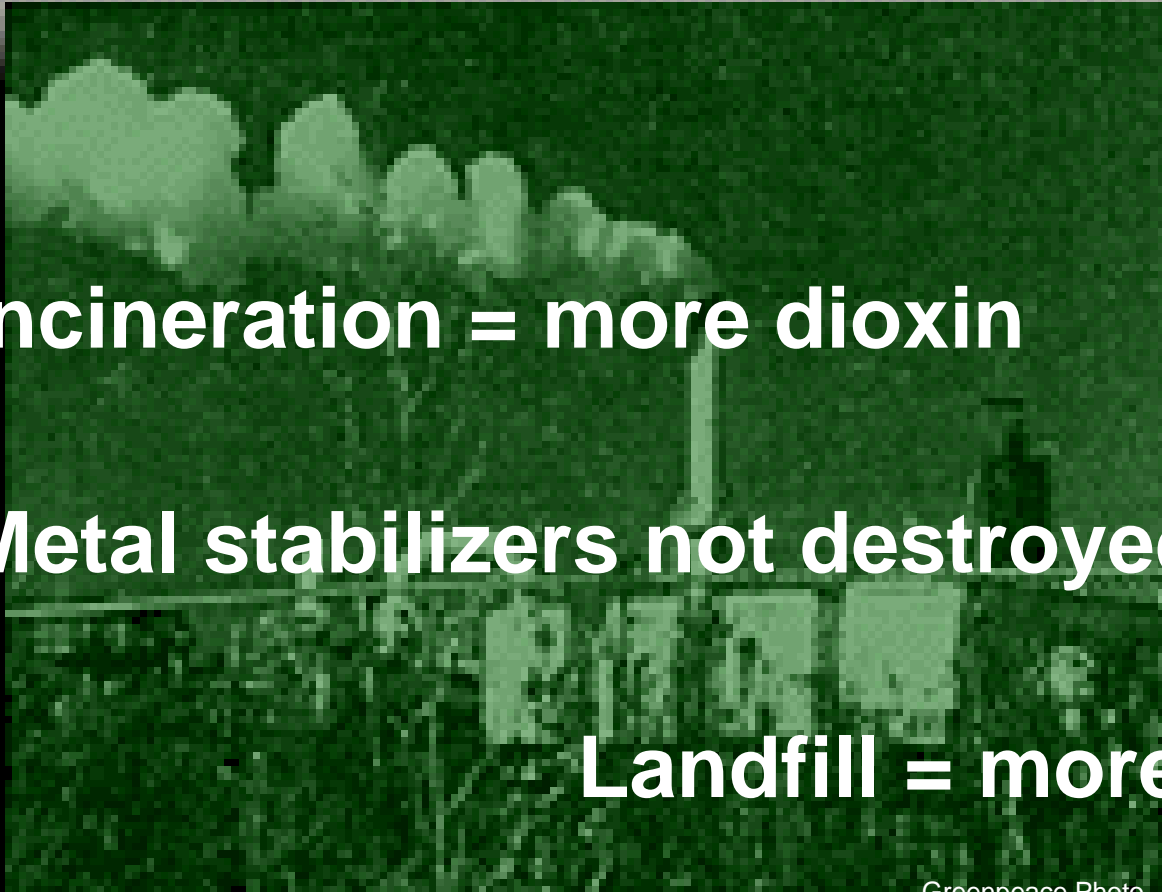
AP/Richard Cohen

PVC – Never goes away

Incineration = more dioxin

Metal stabilizers not destroyed

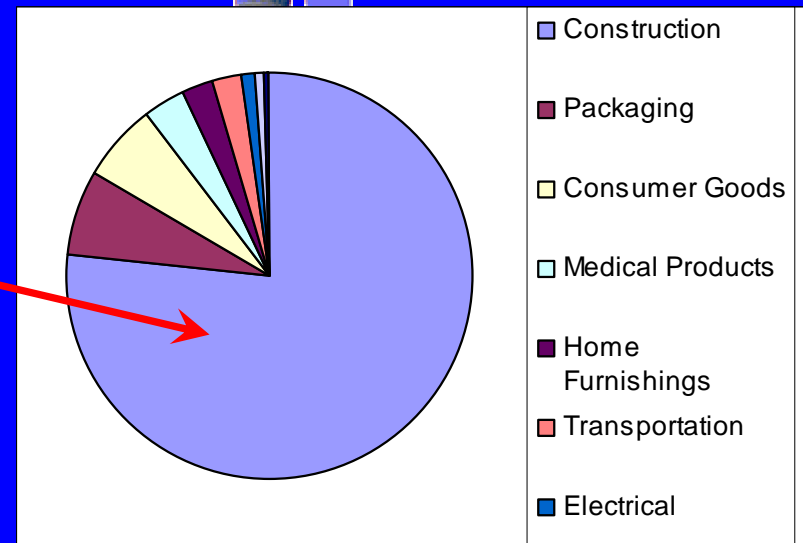
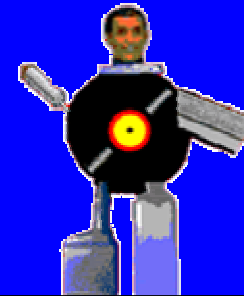
Landfill = more leaching



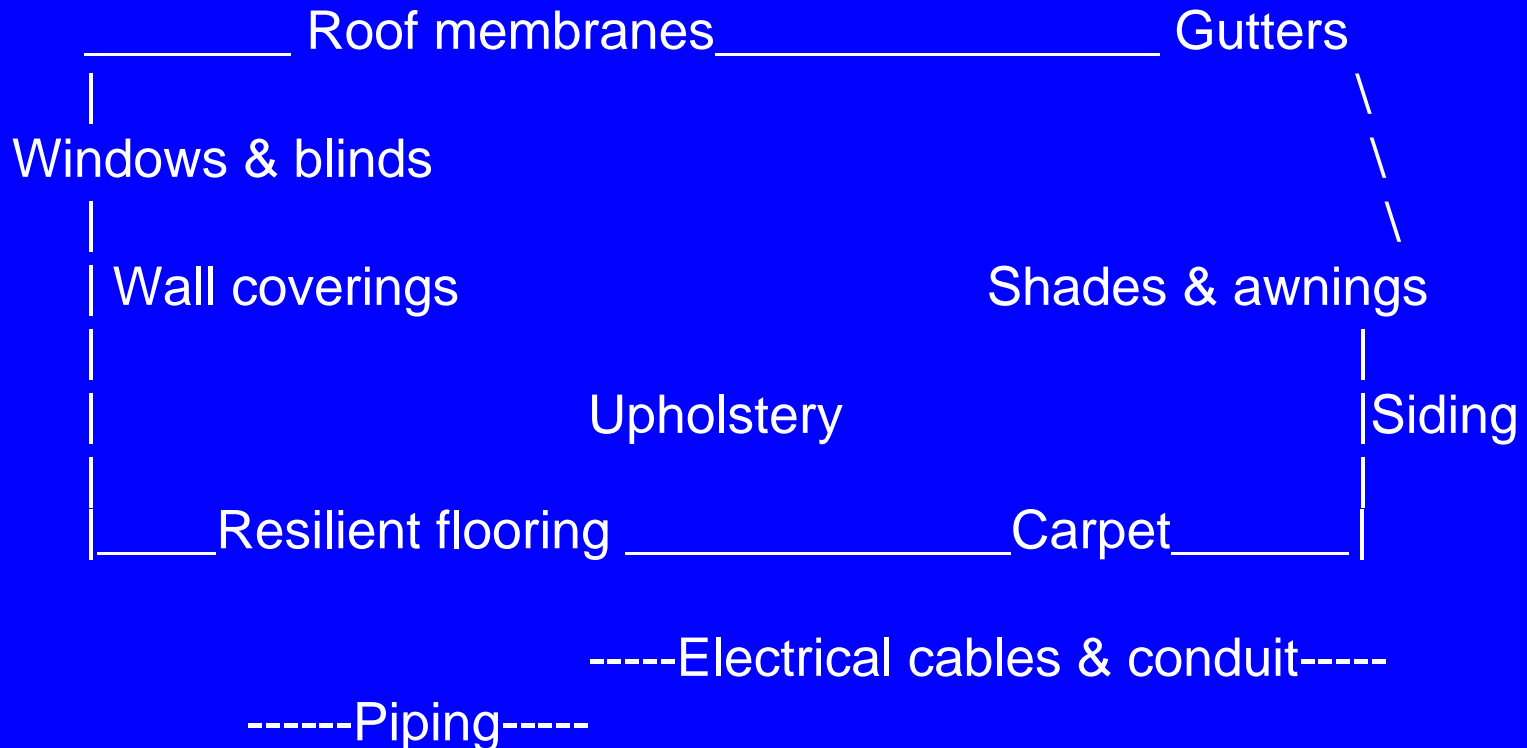
Greenpeace Photo

PVC: Poly vinyl chloride (vinyl)

- Annual N.A. PVC production
> 14 billion pounds
- Over $\frac{3}{4}$ in construction



Where is the vinyl?



Alternatives are available

Resilient flooring

- Natural linoleum
- Recycled rubber
- Cork
- Recycled tile
- Bamboo
- Sustainably harvested wood
- Polymers



Alternatives

Carpet backing

- Natural fibers
- Leased carpet
- Polyolefin, Polyurethane, other polymers

Alternatives

Wall coverings

- **Xorel** Polyethylene
- **Allegory** Wood fiber/polyester blend
- **DesignTex** Recycled polyethylene
- **McDonough** Wool/ramie blend
- **Fabrics/natural fibers**

Alternatives

Piping – **biggest use of PVC**

- **HDPE** (High Density Polyethylene)
less expensive, lower energy, easy recycle
- **Copper**
- **Clay**
- **Cast iron / ductile iron**
- **Concrete**

Alternatives

Roof membranes (low slope – cool roofs)

- **TPO** – Thermoplastic Polyolefin
- **EPDM** - Ethylene Propylene Diene Monomer
- **MBM** – Modified Bitumen
- **NBP** (Nitrile butadiene polymer)

Alternatives

Wiring

- **XLPE** (Thermoset Crosslinked Polyethylene)
- **LLDPE** (Linear Low Density Polyethylene)
- **Polyolefin**
- **Conduit & boxes:** galvanized steel or aluminum

But What Will It Cost?

- **Roof membranes:** TPOs & EPDM competitive
- **Resilient flooring:** Most match or beat vinyl on life cycle cost
- **Carpet:** Competitive in mid range, consider alternates to carpet
- **Wall coverings:** Cost competitive
- **Pipes:** PE can be competitive
more resilient
- **Windows:** Cost more, last longer
- **Wiring:** Alts cost more, but consider fire risk. Need more market pull

Just do it

- Nike 
 - General Motors  Volkswagen 
 - IKEA  Lego  Matell 
 - USEPA HQ, American Public Health Association
 - Houston Nursing & Biomedical Sciences Center
 - US Navy in its vessels
 - NY City Transit Authority in subways
 - Sydney 2000 Olympics
 - and numerous European governments
- ...Are going PVC free,
you can too

Dioxin resolutions

“urges San Francisco health care institutions to reduce PVC use and eventually become PVC-free” and resolves that the City “assess its current purchasing practices and encourage that less-toxic, non-chlorinated products and processes, such as ...PVC-free plastics are supported and used by the City and County of San Francisco”

Similar resolutions:

Berkeley, Oakland, Alameda, Marin County and ABAG

Laguna Honda Hospital (LHH) Replacement Project

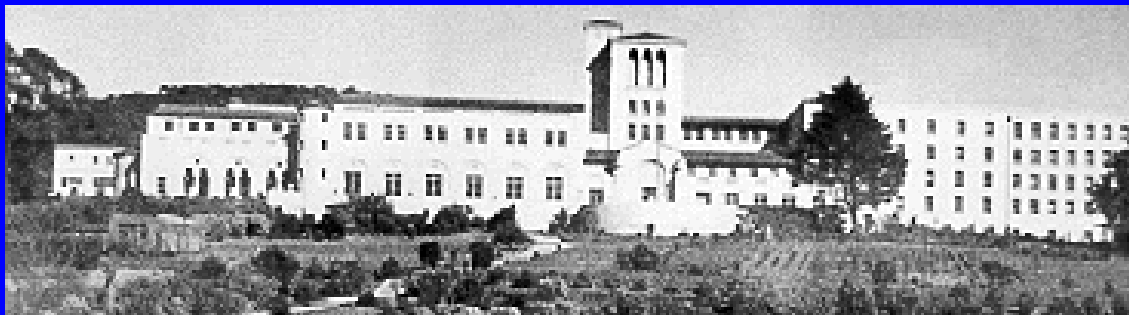
- Existing 1200 bed residential long term care facility with small (~120 bed) critical care unit
- Replace most of facility
Partial renovation
on small historic portion
- In construction
development



Anshen+Allen

LHH Sustainability Goals

- **LEED Silver rating w/ no PVC**
- **Contribute to LEED for health care**
- **Good IAQ in a hospital**
- **Green demonstration locally and internationally**
- **Educational opportunities**
- **Green Operations & Maintenance Plan**
- **Contribute to SF Green Building learning process**



PVC reduction status at LHH

Pipes: *HDPW, copper, iron, all non PVC except some pool high temperature*

Roof membrane: *TPO*

Resilient flooring: *linoleum, vinyl(spill concerns)*

Carpet backing: *urethane*

Wall covering: *paint*

Wall & corner guards: *vinyl - big problem area*

Kaiser Green Building Project

Environmental Stewardship Council

- **Standards re-evaluation by Division**

Complete review in 2002

- **Review of Purchasing Agreements**

- Resilient Flooring
- Carpet

- **Life Cycle cost analysis**

How do green materials purchases affect long term costs
(maintenance, liability (slip-fall), pollution prevention)

You can make a difference

- Specify PVC free
- Educate
- Policies
 - Dioxin resolutions
& ordinances
 - USGBC/LEED
PVC free credit





- Brings environmental health issues into the green building movement.
- Coordinates efforts to accelerate the transition to healthier building materials.

Want to learn more?

www.healthybuilding.net



www.healthybuilding.net

- **PVC Free Alternatives Guides**
- **Info on PVC hazards**
- **Healthy Building News**
- **Tele conference trainings**